Submission of Terminal Disclaimer

Applicants submit herewith a Terminal Disclaimer to overcome the initially stated non-statutory double-patenting rejection of claims 1-3, 5-8, 16, 18-21 & 28-30 over claims 1-2, 5-9, 13-14, 17-20, 24-26 & 27-29 in co-pending, commonly assigned U.S. Patent Application No. 10/726,377.

This Terminal Disclaimer, signed by the attorney of record, is submitted without acquiescing to the propriety of the rejection stated.

Remarks

Reconsideration and allowance of all claims are respectfully requested. Claims 1-32 remain pending; including, independent claims 1, 16 & 28.

Initially, withdrawal of the non-statutory double-patenting rejection to claims 1-3, 5-8, 16, 18-21 & 28-30 over certain stated claims in commonly assigned, co-pending application Serial No. 10/726,377 is requested in view of the Terminal Disclaimer submitted herewith.

In the Office Action, claims 1-2, 4-8, 10-11, 16-17, 19-21, 23-24 & 28-32 were rejected under 35 U.S.C. §102(b) as being anticipated by Takahashi et al. (U.S. Patent No. 6,182,742; hereinafter Takahashi), while claims 3, 9, 18 & 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over Takahashi, and claims 12-15 & 25-27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Takahashi in view of Nakagawa et al. (U.S. Publication No. 2003/0081380; hereinafter Nakagawa). Each of these rejections is respectfully, but most strenuously, traversed and reconsideration thereof is requested.

Applicants request reconsideration and withdrawal of the anticipation and obviousness rejections on the following grounds: (1) the Office Action fails to state a *prima facie* case of anticipation/obviousness against the claims at issue based upon a misinterpretation of the teachings of Takahashi applied to the claims at issue; and (2) the Takahashi and Nakagawa patents fail to teach or suggest various aspects of Applicants' recited invention.

Failure to State Prima Facie Case of Anticipation/Obviousness Based on Misinterpretation of Takahashi When Applied to Claim Language At Issue:

Independent claims 1, 16 & 28 recite a cooling technique which includes:

- multiple coolant conditioning units (CCUs);
- *each CCU* of at least some coolant conditioning units of the multiple coolant conditioning units *providing system coolant to a different, associated electronic subsystem of multiple electronic subsystems to be cooled*;
- each CCU of the at least some CCUs including a heat exchanger, a first cooling loop with a control valve, and second cooling loop, the first cooling loop receiving chilled facility coolant from a source and passing at least a portion thereof via the control valve through the heat

exchanger, the second cooling loop providing cooled system coolant to the associated electronic subsystem, and expelling heat in the heat exchanger from the associated electronic subsystem to the chilled facility coolant in the first cooling loop;

- wherein the control valve allows regulation of facility coolant flow through the heat exchanger, *thereby allowing independent control of a desired temperature of the system coolant in the second cooling loop for cooling the associated electronic subsystem.*

In Applicants' recited invention, there are multiple CCUs, and each CCU provides system coolant to a different, associated electronic subsystem of multiple subsystems to be cooled. The control valve of each CCU allows regulation of facility coolant flow through the heat exchanger, which allows independent control of desired temperature of the system coolant in the second cooling loop for cooling the associated electronic subsystem. Thus, in accordance with Applicants' recited invention, a mechanism is provided for allowing a different system coolant temperature through different, associated electronic subsystems. Applicants respectfully submit that these aspects of their recited invention are not addressed in the Office Action, and as such, the Office Action fails to state *prima facie* anticipation and obviousness rejections.

More particularly, Takahashi describes a cooling apparatus for use in an electronic system. The cooling apparatus 1100 has two internal cooling control units 1100A & 1100B. Each cooling control unit is of an identical arrangement and provides cooling liquid to a distribution header 1200 for distribution to a plurality of electronic subsystems 100, only one of which is shown in FIG. 1. A tank 1400 receives and temporarily stores warmed cooling liquid returned from the plurality of electronic subsystems 100. This cooling liquid is then returned to the two cooling control units 1100A & 1100B. (See FIG. 1 of Takahashi and column 2, lines 27-44).

In rejecting Applicants' independent claims, the Office Action states, in part:

> Each CCU at least some cooling units of the multiple CCUs providing system coolant to a different associated electronic subsystems (FIG. 1, number 100) of multiple electronic subsystems (column 2, lines 34-35) to be cooled ...

This characterization of the teachings of Takahashi is respectfully, but most strenuously, traversed. As is clear from FIG. 1 and the description in Takahashi, a plenum 1200 is employed to distribute cooling liquid to a plurality of electronic systems 100. A tank 1400 temporarily stores the warmed cooling liquid returned from the plurality of electronic systems 100. The multiple cooling control units 1100A & 1100B in Takahashi do not *each* provide system coolant to a different, associated electronic subsystem. Rather, the cooling control units 1100A & 1100B in Takahashi *both* provide system coolant to multiple electronic systems 100. In view of this, Applicants respectfully submit that the Office Action mischaracterizes Takahashi when alleging that their recited invention is anticipated by or rendered obvious in view of the teachings thereof, and as such, fails to state a *prima facie* case of anticipation/obviousness against the pending claims. For at least this reason, reconsideration and withdrawal of the substantive rejections stated in the Office Acton are respectfully requested.

Takahashi Fails to Teach or Suggest Various Aspects of Applicants' Invention:

As noted above, Applicants' independent claims recite multiple coolant conditioning units (CCUs), wherein *each CCU* of at least some coolant conditioning units *provides system coolant to a different, associated electronic subsystem of multiple electronic subsystems to be cooled.* A careful reading of Takahashi and Nakagawa fails to uncover any suggestion of this aspect of Applicants' invention. In Takahashi, the electronic system cooling apparatus 1000 includes two cooling control units 1100A & 1100B, which provide cooling liquid through a distribution header 1200 to the multiple electronic systems. There is no one-to-one correspondence between a cooling unit in Takahashi and an electronic system to be cooled. Based on this, Applicants respectfully submit that there is no teaching or suggestion of their recited invention in Takahashi.

Further, Applicants' independent claims recite that each CCU includes a control valve which allows regulation of facility coolant flow through the heat exchanger. This allows independent control of a desired temperature of the system coolant in the second cooling loop for cooling the associated electronic subsystem. No such control is available with the teachings of Takahashi since a common distribution header and common tank are employed. For this additional reason, reconsideration and withdrawal of the anticipation rejection to the independent claims is respectfully requested.

The dependent claims are believed allowable for the same reasons noted above with respect to the independent claims, as well as for their own additional characterizations.

For example, claims 6, 19 & 29 recite that the multiple CCUs include multiple CCU *pairs. Each CCU pair* including a dedicated CCU and a redundant dedicated CCU *for cooling a different, associated electronic subsystem of the multiple electronic subsystems.* Although the language of Applicants' claims is repeated in the Office Action, there is no recognition that Applicants are reciting that each CCU pair cools a different, associated electronics subsystem of the multiple electronic subsystems. In Takahashi, the two cooling control units share a distribution header and a warmed liquid return tank in cooling a plurality of electronic systems 100. In contrast, Applicants' recite a cooling system configuration wherein there are multiple CCU pairs, with each CCU pair having a dedicated CCU and a redundant CCU, and each pair cooling a different, associated electronic subsystem.

Claims 11 & 24 recite that each CCU further includes a reservoir in series with the second cooling loop for ensuring an adequate supply of system coolant flow through the second cooling loop. In Applicants' system, each coolant conditioning unit of the multiple coolant conditioning units has a reservoir in series with the second cooling loop. In contrast, Takahashi teaches a reservoir 1400 that is shared by the two cooling control units in series with the second cooling loops thereof. Clearly this is a different structure than that recited by Applicants in the claims at issue.

With respect to dependent claims 3 & 18, Applicants recite that the common source of chilled facility coolant includes at least two source input lines and at least two source return lines. Each input line and each return line services at least two CCUs of the multiple CCUs. Again, the respective independent claims recite that each CCU provides system coolant to a different, associated electronic subsystem. Since the cooling control units of Takahashi together provide cooling liquid to multiple electronic systems through the distribution header and common return tank, no similar configuration to that recited by Applicants in these claims is presented. Applicants respectfully submit that it is not a simple matter of duplicating the chilled facility source input and return lines of Takahashi to ensure redundancy since the coolant conditioning units each provide system coolant to a different, associated electronic subsystem.

With respect to dependent claims 12-15 & 25-27, Applicants respectfully submit that Nakagawa does not teach or suggest the above-noted deficiencies of Takahashi when applied against the respective independent claims. Again, these claims need to be interpreted in light of the above-noted differences of the independent claims relative to the Takahashi patent. Even if one were to accept the combination of Nakagawa with Takahashi as proposed in the Office Action, the resultant cooling system still would not teach or suggest Applicants' recited invention. Notwithstanding this, Applicants respectfully traverse the applicability of Nakagawa to the claims at issue.

In Nakagawa, a liquid cooling system for a notebook computer is presented, wherein a single cooling loop is shown in FIG. 10 along with a reserve tank which includes replenishment liquid that is fed into the single cooling loop through a check valve. In contrast, Applicants' claims at issue recite an external system coolant reservoir which is shared by at least two CCUs of the at least some CCUs. Claims 15 & 27 further recite that each second cooling loop of the at least two CCUs is coupled to the common supply line via an upwardly extending branch line which continues to hold system coolant notwithstanding removal of system coolant from the common supply line. Again, this language is in combination with the at least two CCUs recited in the independent claims and the external coolant reservoir shared by the at least two CCUs.

Advantageously, Applicants provide herein a cooling system configuration wherein failure of one CCU, for example, through damage to a system loop thereof, will only effect the associated electronic subsystem, and not the remaining electronic subsystems of the multiple electronic subsystems to be cooled. No such facility is provided by a combination of Nakagawa and Takahashi. There is no isolation of CCUs in Takahashi, and as such, damage to a cooling liquid supply line thereof will cause the entire cooling system to fail, resulting in a cessation of cooling to the multiple electronic systems.

For at least this additional reason, reconsideration and withdrawal of the rejection to claims 15 & 27 is requested.

Additionally, Applicants respectfully submit that the Office Action fails to state a *prima facie* case of obviousness against dependent claims 14 & 26. The Office Action alleges that it would have been obvious to one of ordinary skill in the art at the time the invention was made to duplicate the chilled facility coolant source input lines. However, simple duplication of chilled

facility coolant source input lines is not being recited in the claims, and in fact, is not relevant to the language at issue. In Applicants' recited invention, a different supply line connects the external system coolant reservoir to the second cooling loop of each CCU of the at least some CCUs. Thus, the discussion in the Office Action regarding duplicating the chilled facility coolant source input lines is not believed relevant to the recited invention, and as such, Applicants respectfully submit that a *prima facie* case of obviousness is not stated.

For at least the above-noted reasons, Applicants request reconsideration and withdrawal of the anticipation and obviousness rejections set forth in the initial Office Action.

All claims are believed to be in condition for allowance and such action is respectfully requested.

If a telephone conference would be of assistance in advancing prosecution of the subject application, Applicants' undersigned attorney invites the Examiner to telephone him at the number provided.

Respectfully submitted,

Kevin P. Radigan

Kevin P. Radigan
Attorney for Applicants
Registration No.: 31,789

Dated: March 14, 2006.

HESLIN ROTHENBERG FARLEY & MESITI P.C.
5 Columbia Circle
Albany, New York 12203-5160
Telephone: (518) 452-5600
Facsimile: (518) 452-5579